

What is claimed is:

1. A system, comprising:

an input source providing a polygonal base mesh having a  
face; and  
5 a computer analyzing the mesh and determining an identifier  
for the face comprising a base face identifier, a vertex index and a path to  
the face.

10 2. A system as recited in claim 1, wherein the identifier  
further comprises a level indicator indicating a subdivision level of the face.

3. A system as recited in claim 2, wherein the identifier is  
stored as a fixed bit integer.

15 4. A system as recited in claim 3, wherein said computer  
disregards leading zeros in the path responsive to the level when accessing  
the face using the identifier.

5. A system as recited in claim 1, wherein said computer  
determines a unique vertex name for a vertex of the face.

6. A storage as-recited in claim 1, wherein said computer  
determines a unique edge name for an edge of the face.

7. A system as recited in claim 1, wherein the vertex index identifies a level one subdivision vertex of a zero level subdivision base mesh face corresponding to the face.

5        8. A system for providing unique names for faces and vertices in an hierarchical subdivision surface from which each face of a surface, each vertex of a surface and each edge of a surface can be unambiguously identified, said system comprising:

an input source providing a polygonal base mesh having a face; and

10        15        a computer analyzing the mesh, determining an identifier for the face, disregarding leading zeros in the path responsive to the level when accessing the face using the identifier, determining a unique vertex name for a vertex of the face, determining a unique edge name for an edge of the face, with the face comprising a base face identifier, a vertex index and a path to the face, with the vertex index identifying a level one subdivision vertex of a zero level subdivision base mesh face corresponding to the face, with the identifier comprising a level indicator indicating a subdivision level of the face and with the identifier stored as a fixed bit integer.

20        20        9. A method of determining a unique identifier for a face of a mesh in a subdivision surface, comprising:

determining a base mesh face;

determining a vertex index of the face; and

determining a path to the face.

25        25        10. A method as recited in claim 8, further comprising determining a subdivision level of the face.

11. A method of accessing a face of a mesh in a subdivision surface, comprising:

obtaining a face identifier including a base face index, a vertex index and a path to the face; and

traversing the path to the face using the base face index and  
the vertex index.

5           12. A method as recited in claim 11, wherein the identifier includes a level and the traversing includes a number of repeated steps which number is responsive to the level.

10           13. A computer readable storage having a face name data structure providing an identifier for a subdivision surface face and controlling a computer comprising a base face identifier field, a vertex index field and a path field of a path to the surface face.

14. A storage as recited in claim 13, further comprising a level indicator indicating a subdivision level of the face.

15           15. A storage as recited in claim 13, further comprising a unique vertex name for a vertex of the face.

16. A storage as recited in claim 13, further comprising a unique edge name for an edge of the face.